

Nailed it!

NUMBER



NUMBER

## Had a look

Nearly there Nailed it!



## Now try this

- 1 Write these in order of size, smallest first:  $\frac{9}{20}$ 0.6 0.55 (1 mark)
- 2 Give evidence to show that  $\frac{1}{250}$  can be written as a terminating decimal. (2 marks)

)
(

```
Show that \frac{1}{140} cannot be written as a
erminating decimal.
                                     (2 marks)
```

4 Write  $\frac{5}{11}$  as a recurring decimal. (2 marks)

6

Had a look Nearly there Nailed it!

NUMBER

	Estimation		
	You can estimate the answer to a calculation by rounding each number to <b>1 significant figure</b> and	Decimal division trick	
	then doing the calculation. You can use this method	You might have to divide by a	
_	to check your answers, or to estimate calculations on	paper. If you multiply both numbers	
	your <b>non-calculator paper</b> . Here are two examples:	in a division by the same amount	
	4.32 × 18.09 $\approx$ 4 × 20 = 80 The answer is approximately equal to 80	the answer stays the same.	
		X100 X2	
	$\frac{327^{2} \approx 300^{2} = 3^{2} \times 100^{2} = 90000}{\text{The answer is approximately equal to 90000}}$	$\frac{1400}{0.05} = \frac{140000}{5} = \frac{280000}{10} = 28000$	
	a means 'is approximately equal to'		
_		×100 × ×2 ×	
	Worked example		
	Work out an estimate for	Round all the numbers to the significant figure. Then write out the	
-0	(a) $\frac{4.31 \times 278}{0.487}$ (2 marks)	calculation with the rounded values before calculating your estimate.	
-	$\frac{4.31 \times 278}{0.487} \approx \frac{4 \times 300}{0.5} = \frac{1200}{0.5} = 2400$	You can use the laws of indices to	
-0	(b) 37.4 <sup>3</sup> (2 marks)	work out $40^3$ without a calculator.	
-	$-37.4^3 \approx 40^3 = 4^3 \times 10^3 = 64 \times 1000 = 64000$	$50 \ 40^3 = (4 \times 10)^3 = 4^3 \times 10^3$	
	h at a state of a stat		
	157a x 17 C	d example	
_	On your non-calculator paper		
	start by writing $\pi = 3.142$ A sphe	erical ball-bearing has a radius of 2.35 cm.	
	then round to 1 s.f. to make your estimate.	ace area of sphere $-4\pi r^2$	
	Suite	ace area or sphere – + #/	
	Examiners report (a) Wo	ork out an estimate for its surface	
	You have rounded <b>both values down</b> so your	ea in square centimetres. (2 marks)	
	answer will be an underestimate. The question $4\pi r^2$	$\approx 4 \times 3.142 \times 2.35^{-1}$	
	a conclusion <b>in words</b> . (b) Is y	your answer to part (a) an overestimate	
	Real students have struggled with questions	an underestimate? Give a reason for	
	like this in recent exams – <b>be prepared</b> !	3.142 and 2 < 2.35	
-	so the	e answer is an underestimate.	
	Now try this		
	1 Showing your rounding 2 A scientist model	ls a raindron as a sphere with radius 3.2mm	
	work out an estimate for Volume of a sph	here $=\frac{4}{3}\pi r^3$	
w	$\frac{82 \times 285}{64 \times 35}$ (2 marks) (a) Work out an	estimate for the volume	
vi	dee of the raindr (b) Is your answ	er to part (a) an overestimate or	
	an underesting watch a video of this question being solved	mate? n for your answer. (1 mark)	

7